P12 - 10.0 - Mag Review

$\vec{F} = \vec{B}IL$ $\quad \vec{B} = \mu_0 nI = \mu_o \frac{N}{L} I = \frac{\mu_0 I}{2\pi r}$ $\quad \in = \vec{B}Iv$ $\quad \Phi = \vec{B}A$ $\quad F = \vec{B}IL\sin\theta$

$\vec{F} = Qv\vec{B}$ $\quad n = \frac{N}{L}$ $\quad V_{back} = \in -Ir$ $\quad \frac{V_s}{V_p} = \frac{N_s}{N_p} = \frac{I_p}{I_s}$ $\quad F = Qv\vec{B}\sin\theta$ $\quad \Phi = \vec{B}A\sin\theta$

$F_c = F_@ \; ; \; Orbit^*$ $\quad \epsilon = -N\frac{\Delta\Phi}{\Delta t}$

$\vec{F}$: Magnetic Force N

$\vec{B}$: *Magnetic Field Strength aka Magnitude of Electric Field; Teslas T*

μ_o : *Permeability of free space* ; $4\pi \times 10^{-7}\frac{Tm}{A}$

n : *Loops per meter* ; $\frac{\#}{m}$

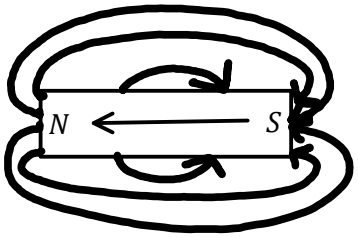
N : *Total # Loops* ; #

L : *Length in Magnetc Field* ; m

A : *Area of Loop* ; m^2

Φ : *Flux* ; Tm^2 *or Weber* Wb

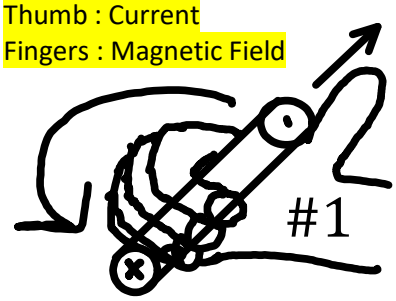
$\in$: *Electromotive Force (emf)* ; V



Magnetic N^* *= S Pole*

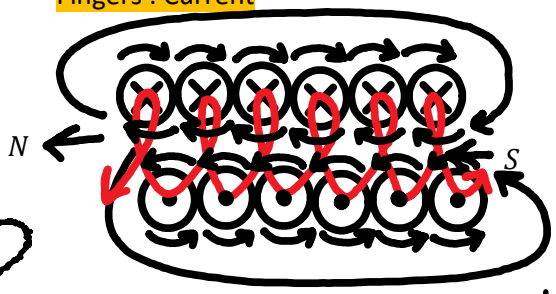
Current carrying wire is surrounded by an magnetic field

1*st Right Hand* : *Wire*
Thumb : Current
Fingers : Magnetic Field

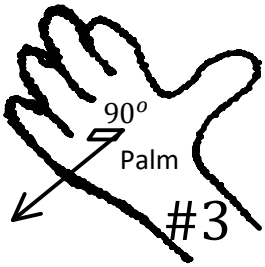


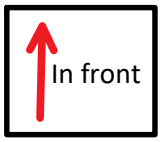
Current/Magnetic Field
X : *Into page*
● : *Out of page*

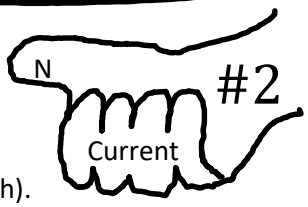
2*nd Right Hand* : *Coil* (*Switch Rule #1*)
Thumb : Magnetic Field (North)
Fingers : Current



3*rd Right Hand* : *Magnetic Field*
Thumb : Current (Like 1st)
Fingers : Magnetic Field (Like 1st)
Palm : Force







Force only if: current at 90^o to the magnetic field (Force is perpendicular to both).

Conventional Current $+ \rightarrow -$
Right Hand Rule* *Proton*
Left Hand Law* *Electron Flow*
(Or back of right hand!)

Electric current is generated by changing fields.
Particles moving parallel to magnetic field $F = 0$

Magnetic Flux : # of field lines that pass through a coil.
Highest : perpendicular loop
Lowest : parallel loop.

Electric Motors
Cathode Ray Tubes e^-

Induction: production of an electric/magnetic state by proximity to an electrified/magnetized body.